

Soil Workshops for Health Department Users

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ABSTRACT

Soils related issues are some of the main determining factors of successful onsite wastewater management. The Soil Science Society of Georgia, The University of Georgia, and The Georgia Health Department are developing a cooperative program to train health department professionals in recognizing and solving soil challenges. Historically, the three groups have been developing a program based upon the soil mapping of series and interpretations of the site specific map units based upon the National Cooperative Soil Survey Standards. Joint workshops conducted in January and February, 2008, established the need for an organized series of workshops to be held annually throughout the state focusing on universal and localized soils issues. Additionally, the workshop discussions develop and articulate the awareness of the potentials and limitations of soil mapping and interpretations.

History

In the early 1980's the Natural Resource Conservation Service and The Georgia Health Department developed the transition from percolation test based site permitting to site specific soil mapping for onsite wastewater management. In the 1990's soil scientists developed a soil series based on the CT-1 Table for relating estimated percolation rates to soil series. Presently, The University of Georgia provides a 40 hour soils orientation class for new Georgia Health Department employees. Persons hired between the orientation classes are paired with active soil consultants for county specific soils training. Plans now exist to expand the training so that personnel that have been in the field long enough are able to participate in advanced soil workshops.

Developing Advanced Soils Workshops

The Soil Science Society of Georgia has held at least one annual fieldtrip dedicated to soils related issues. Since the society has many members that are not onsite wastewater consultants the fieldtrips also investigate other concerns. In January and February, 2008, The Soil Science Society of Georgia held workshops in North Georgia and South Georgia. The society specifically invited Department of Health personnel with the result of large attendances at both events.

The University of Georgia hosted the first workshop, The North Georgia Workshop, at The Plant Sciences Farm in Watkinsville, GA. The title of the workshop was *Soil Water Movement and Restrictive Horizons*. The Soil Science Society of Georgia and The University of Georgia compiled a 200-plus page handbook (cost \$12/ea) consisting of power point presentations, maps, permeability data sets, related scientific articles, Official Soils Series Descriptions, Aardvark Soil Permeameter information, and downloads from the USDA-NRCS website. Downloaded and reprinted sections included relevant parts of the *Soil Survey Manual*, *The Urban Soils Primer* and *Soil Survey Technical Note No. 6: Saturated Hydraulic Conductivity: Water Movement Concepts and Class History*. The manual was designed as a long term reference tool for Department of Health Users.

The North Georgia Workshop was broken into two sections: the first section was an indoor soil physics orientation and the second section was outdoor field review of principles and discussions of soil influences on water movement. The soil physics orientation included several power point presentations: *Field Measurements of Soil Hydraulic Conductivity, K_s* (West 2008), *Evaluation of Saturated Hydraulic Conductivity in Piedmont Landscapes* (Bishop et al. 2007), and *Relating Saturated Hydraulic Conductivity and Percolation in Borehole Permeameter Tests* (Radcliffe and West 2000). The outdoor session was a field tour of a variable soils site at The University of Georgia Plant Sciences Farm. Earlier in the month soil scientists conducted soil permeameter tests on selected soil depths near pits. The investigators selected an array of three simultaneous tests at five depths: 24 inches, 36 inches, 48 inches, 60 inches, and 72 inches, to illustrate the variability within the same depths and at different depths. Using the clear graduated reservoirs of the Aardvark Soil Permeameter[™] (Macfie 2007) allowed the participants to visualize soil permeability variability. Correlating the permeameter results with visible soil properties provided animated discussions. This workshop accomplished the goal of stressing site specific variability over the three dimensions of soils.

A second workshop, The South Georgia Workshop, was held in the Southern Coastal Plain near Savannah, Georgia. Since the original University of Georgia orientation classes are traditionally held in the Georgia Piedmont local users wanted guidance on Southern Coastal Plain and Atlantic Flatwoods Soils. The purpose of this workshop was to identify soil limitations for on site sewage treatment systems in coastal plain soils. Georgia Department of Health employees and soil scientists were able to interact as they reviewed undisturbed soil characteristics in soil pits. Participants measured soil permeability with Ksat instruments at each site. The workshop targeted identifying seasonal water table indicators and determining soil permeability. The participants discussed site modification due to seasonal high water table and measured permeability at each site. Department of Health employees received data from different sources and wrote permits using this data. This hands on workshop gave them the ability to understand how the soil information is obtained.

Joint Plans for Soils Continuing Education Workshops

The Soil Science Society of Georgia, The University of Georgia, and The Georgia Department of Health are developing a joint training plan for Advanced Soils Workshops. The State of Georgia will have six training regions: The Ridge and Valley, The Blue Ridge Mountains, The Eastern Piedmont, The Western Piedmont, Southeastern Georgia Coastal Plain and Atlantic Flatwoods, and Southwestern Georgia Coastal Plain. The Sand Hills and Black Prairies will be included in the South Georgia regions as needed. Each region has a regional Soil Science Society of Georgia Coordinator whose responsibility is to identify local soils issues and to provide fieldtrips addressing these issues. Each region will have one fieldtrip a year so that six fieldtrips are available in Georgia every year. Many health districts include more than one region so a district may attend more than one fieldtrip a year. The fieldtrips will be open to persons that are not members of either organization when space is available. The plan is to space these two months apart and to be on an annual rotation.

Impact of the Future of the Soil Survey Program

As the National Cooperative Soil Survey moves into a new phase, valid field interaction with users is needed. These workshops are a conduit of applied soil science. Questions such as soil permeability, soil variability, soil identification, and soil degradation are just a few perplexing topics that are discussed every day. Soil Science Societies and The National Cooperative Soil Survey should form an alliance to investigate emerging soil issues.

REFERENCES

Bishop, J., M. Abreu, and L.T. West. 2007. Evaluation of Saturated Hydraulic Conductivity in Piedmont Landscapes. UGA.

Macfie, T.G. et al. 2007. The Aardvark: A Rugged Transportable Constant Head Permeameter for Field Studies. Soil Science Society of America Annual Meeting.

Radcliffe, D.E. and L.T. West. Relating Saturated Hydraulic Conductivity to Percolation and Borehole Permeameter Tests. Soil Survey Hor. 41:99-103.

United States Department of Agriculture – Natural Resource Conservation Service. 1993. Soil Survey Manual. National Soil Survey Center. Lincoln, NE.

United States Department of Agriculture – Natural Resource Conservation Service. 2004. Soil Survey Technical Note No. 6: Saturated Hydraulic Conductivity: Water Movement Concepts and Class History. National Soil Survey Center. Lincoln, NE.

United States Department of Agriculture – Natural Resource Conservation Service. 2005. Urban Soils Primer.

West, L.T. et al. Saturated Hydraulic Conductivity of Soils in The Southern Piedmont of Georgia, USA: Field Evaluation and Relation to Horizon and Landscape Properties. Catena (2007), doi:10.1016/j.catena.2007.07.001

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